

L290

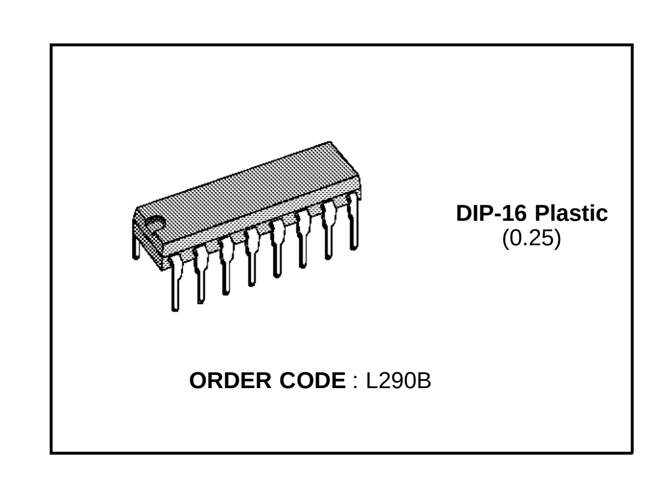
TACHOMETER CONVERTER

DESCRIPTION

The L290, a monolithic LSI circuit in 16-lead inline plastic package, is intended for user with the L291 and L292 which together from a complete **3-chip DC motor positioning system** for applications such as carriage/daisy-wheel position control in typewriters.

The L290/1/2 system can be directly controlled by a microprocessor. The L290 integrates the following functions:

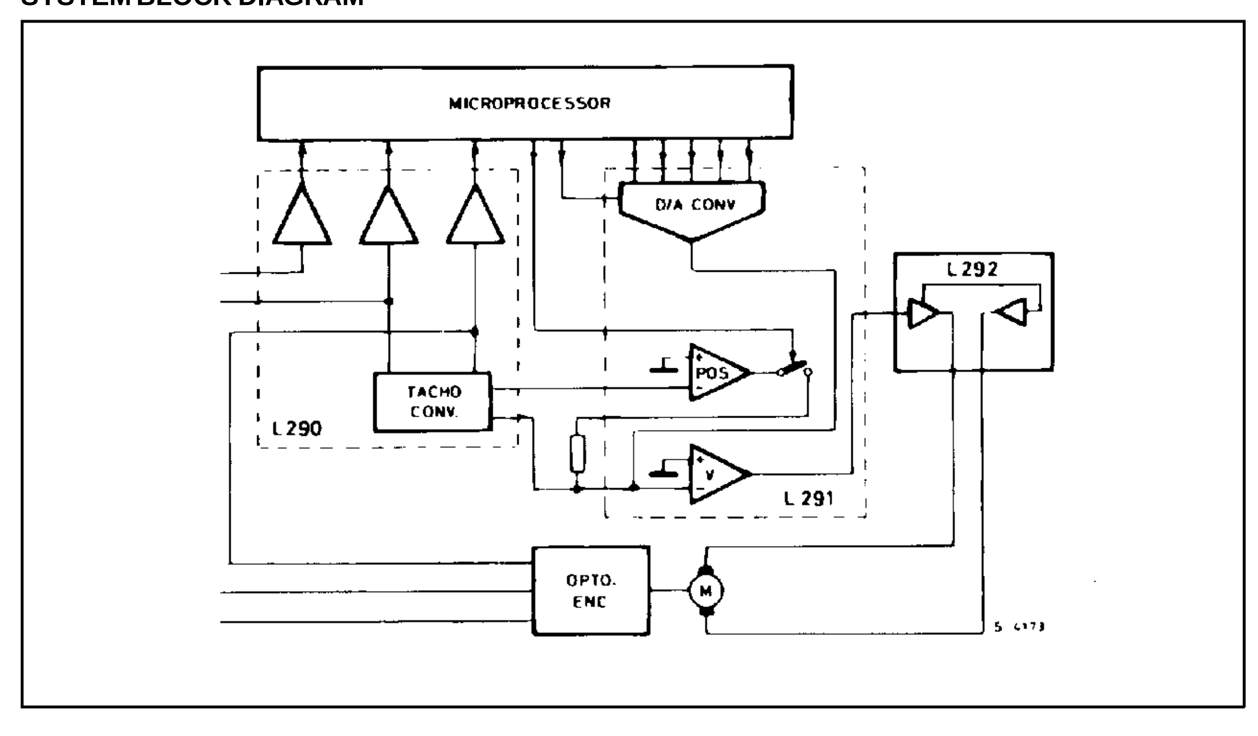
- tacho voltage generator (F/V converter)
- reference voltage generator
- position pulse generator



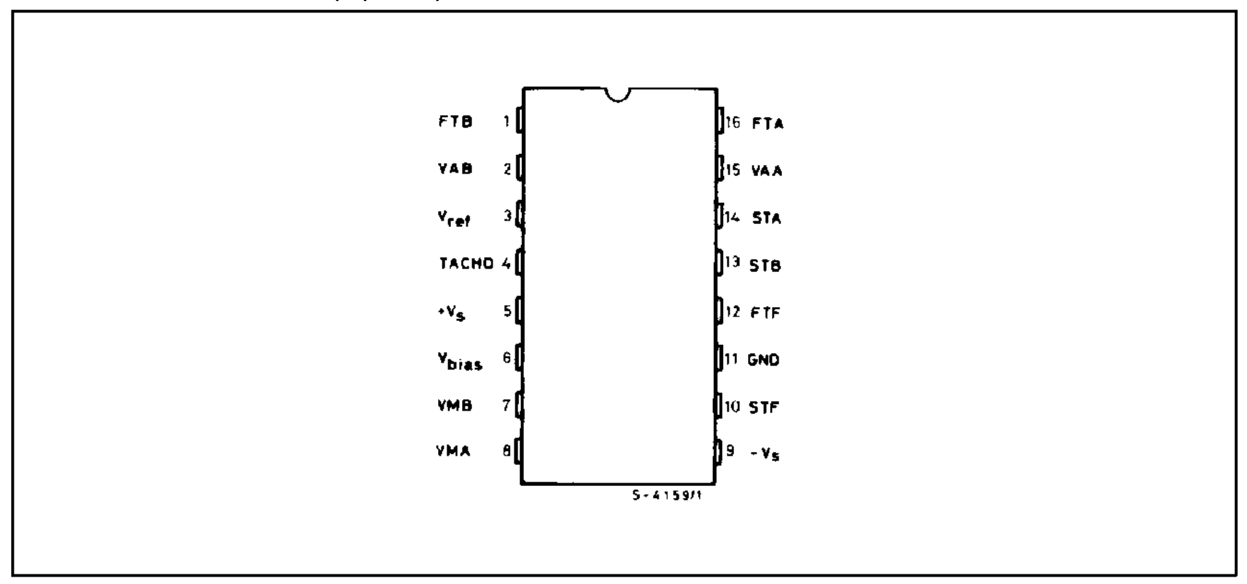
ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V_s	Supply Voltage	± 15	V
V_i (FTA, FTB, FTF)	Input Signals	± 7	V
P_{tot}	Total Power Dissipation (T_{amb} = 70 °C)	1	W
T_{stg}, T_j	Storage and Junction Temperature	- 40 to + 150	°C

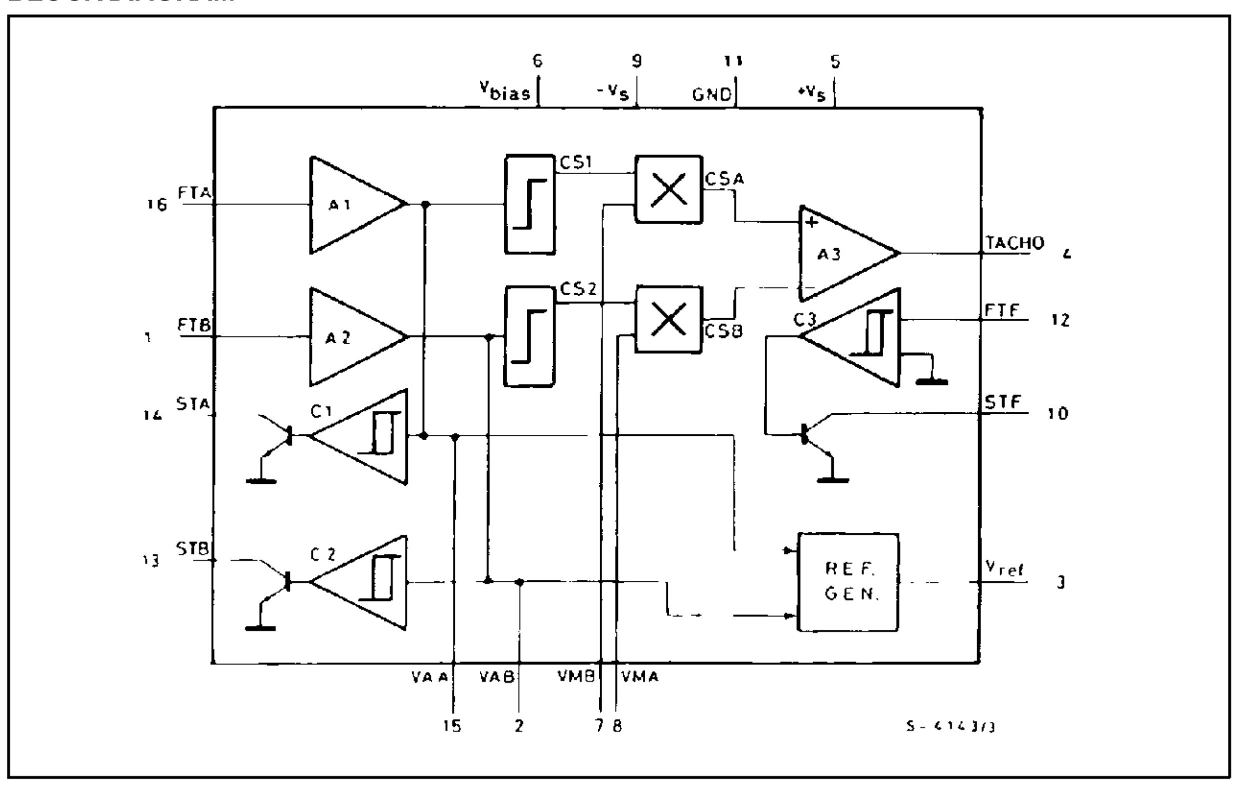
SYSTEM BLOCK DIAGRAM



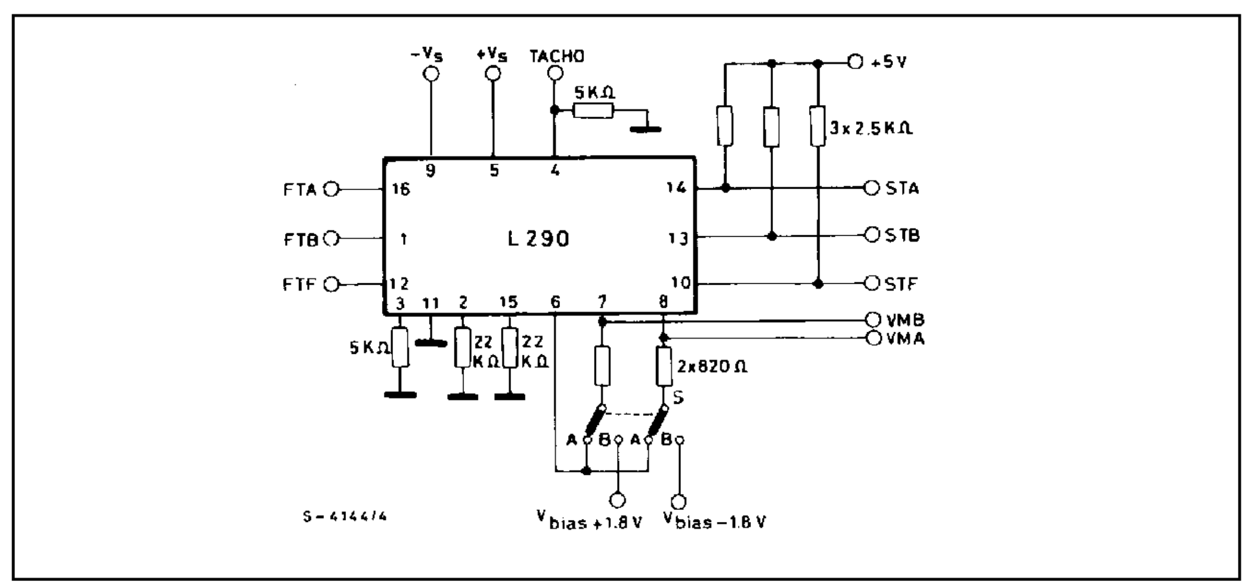
CONNECTION DIAGRAM (top view)



BLOCK DIAGRAM



TEST CIRCUIT



THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th-j-amb}$	Thermal resistance junction-case	Max	80	°C/W

ELECTRICAL CHARACTERISTICS (Refer to the test circuit, S in (A), V_s = ± 12 V, T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_s	Supply Voltage		± 10		± 15	V
I_d	Quiescent Drain Current	V_s = ± 15 V		13	20	mA

INPUT AMPLIFIERS (A_1 and A_2)

FTA, FTB	Input Signal from Encoder (pin 1, 16)	f_{max} = 20 KHz	± 0.4		± 0.6	V_p
V_{os}	Output Offset Voltage (pin 2, 15)	FTA = FTB = 0 V			± 55	mV
I_b	Input Bias Current (pin 1, 16)			0.15		µA
G_v	Voltage Gain	f = 10 KHz FTA= FTB = ± 0.6 V_p	22	23	24	dB
V_0	Output Voltage Swing (pin 2, 15)	FTA = FTB = ± 1Vp	± 9.5			V

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit

COMPARATORS WITH HYSTERESIS (C_1, C_2, and C_3)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{THP} (°)	Positive Threshold Voltage (pin 2, 12, 15)	C_1 and C_2	550		850	mV
		C_3	700		900	mV
V_{THN} (° °)	Negative Threshold Voltage (pin 2, 12, 15)	C_1 and C_2	55		175	mV
		C_3	570		830	mV
ΔFTF	Threshold Hysteresis	C_3	72		120	mV
V_L	Output Voltage (low level) (pin 10, 13, 14)	I_0 = 2 mA FTA = FTB = FTF = 0 V		0.2	0.4	V
I_{leak}	(pins 10, 13, 14)	FTA = FTB = 0.5 V V_{CE} = 5 V FTF = 1 V			1	µA

REFERENCE GENERATOR

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Vref	DC Reference Voltage (pin 3)	FTA = FTB = ± 0.5 V_p (*) I_{ref} = 1 mA	4.5	5	5.5	V
Iref	Output Current (pin 3)				1.4	mA

”TACHO” AMPLIFIER (A3)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_{os}	Output Offset Voltage (pin 4)	FTA = ± 15 mV FTB = 0.5V				± 80	mV
V_o	DC Output Voltage (pin 4)	FTA = FTB = ± 0.5 V_p	(**) V_{01}	5.4	6	6.6	V
		VMA = VMB = ± 1.25 V_p	(***) V_{02}	- 5.4	- 6	- 6.6	V
ΔV_0		V_{01} + V_{02}		- 150		+ 150	mV
V_0	Output Voltage Swing (pin 4)	Sin (B)	FTA = FTB = 0.5V	9			V
			FTA = FTB = -0.5 V	- 9			
V_{MA} V_{MB}	Multiplier Input Voltage (pin 7, 8)				± 1.25	± 1.7	V_p
V_{bias}	Bias Voltage (pin 6)	FTA and FTB Floating		- 6.5		- 8	V

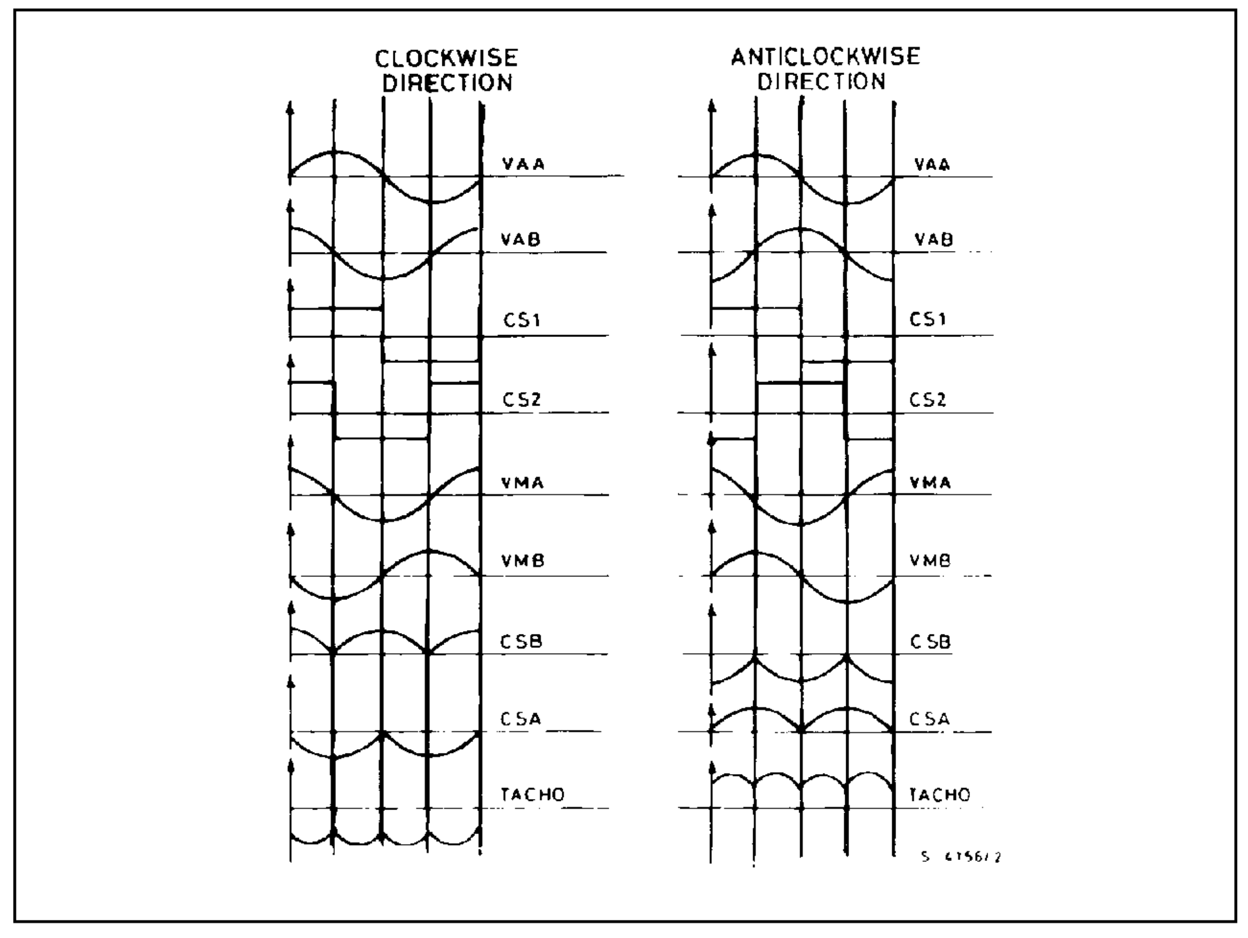
(°) : FTA = FTB = FTF 0 ⁄ 1V (° °) : FTA = FTB = FTF = 1V ╲ 0

Note : Phase relationship between the signals :
- * FTA : 0° FTB : 90°
- ** FTA : 0° FTB : - 90° V_{MA} = 90° V_{MB} = 0°
- *** FTA : 0° FTB : 90° V_{MA} = 90° V_{MB} = 180°



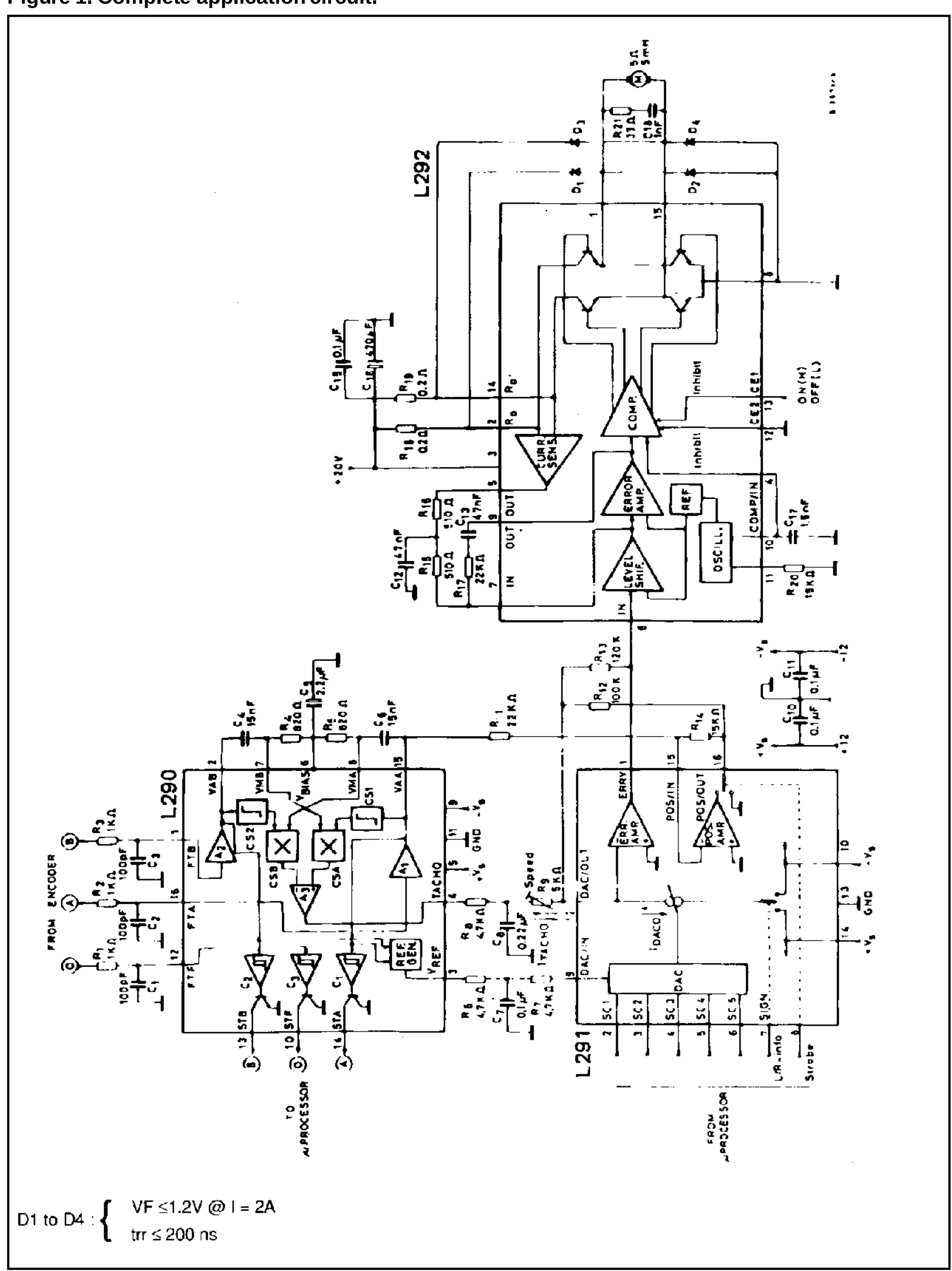


WAVEFORMS (Neglecting threshold volage level of the comparators).



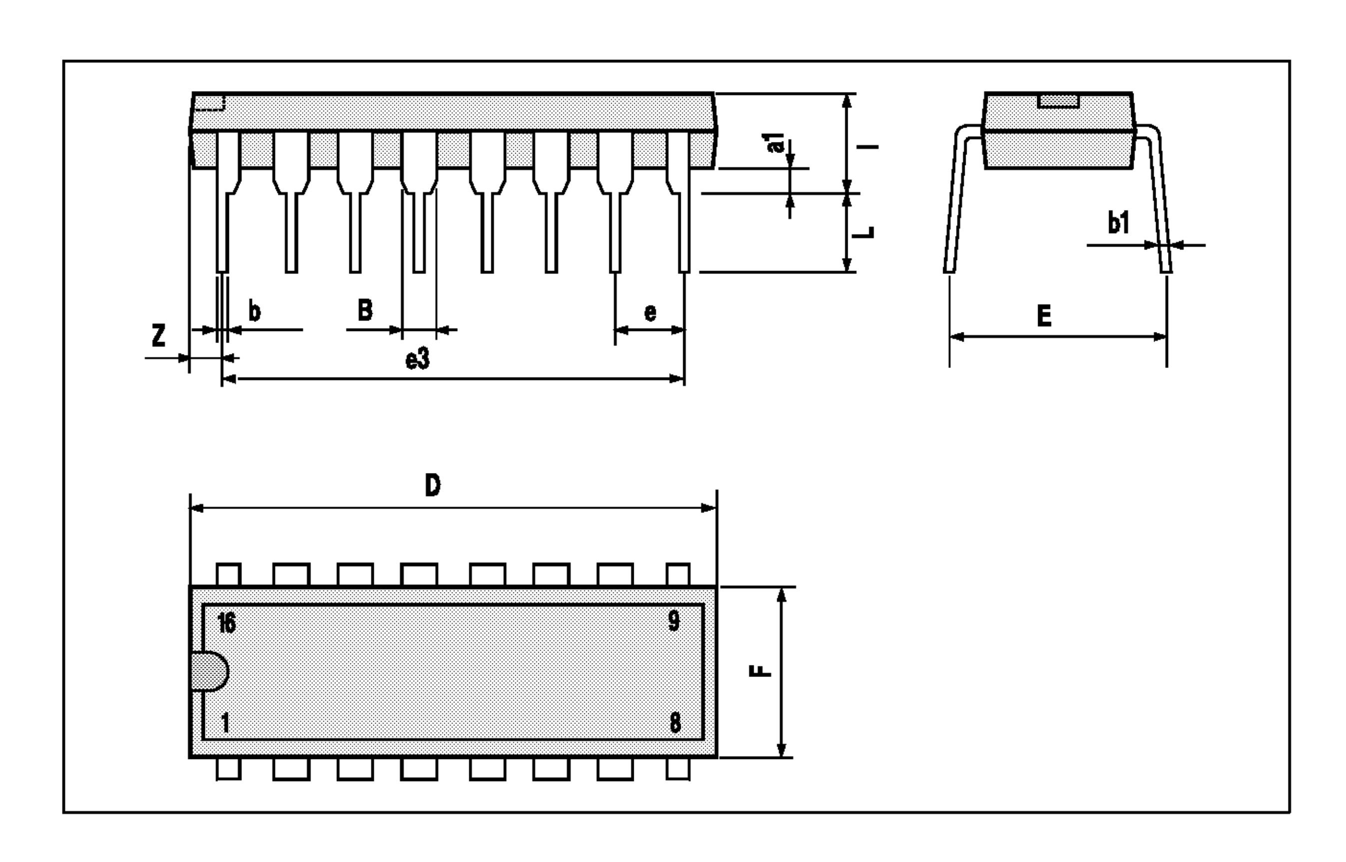
SYSTEM DESCRIPTION : refer to the L292 data sheet.

Figure 1. Complete application circuit.



DIP-16 PLASTIC PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050




SGS-THOMSON
MICROELECTRONICS